

SEQUENCE LISTING

<110> Regents of the University of Minnesota, et al.

5 <120> DNA encoding methymycin and pikromycin

<130> 600.438WO1

10 <150> US 09/105,537

<151> 1998-06-26

<160> 53

15 <170> FastSEQ for Windows Version 3.0

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<211> 15872

<212> DNA

20 <213> Streptomyces venezuelae

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Leu Asp Ser Leu Asp Leu Phe Asp Ala Ala Phe Phe Gly Ile Ser Pro
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85 90 95
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Ser Leu Leu Tyr Gln His Gly Glu Gln Ala Ile Thr Gln His Thr Met
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Leu	Ala	Glu	Ala	Trp	Thr	Asn	Gly	Leu	Thr	Ile	Asp	Trp	Ala	Pro	Val		
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Val	Pro	Glu	Asp	Arg	Ser	Ala	Glu	Ala	Ala	Pro	Val	Leu	Ala	Ala	Leu		
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40	Ser	Gly	Ala	Gly	Ala	Asp	Pro	Val	Gln	Leu	Asp	Val	Ser	Pro	Leu	Gly	

	6245	6250	6255
Asp Arg Gln Arg Leu Ala Ala Thr Leu Gly Glu Ala Leu Ala Ala Ala			
	6260	6265	6270
Gly Gly Ala Val Asp Gly Val Leu Ser Leu Leu Ala Trp Asp Glu Ser			
5	6275	6280	6285
Ala His Pro Gly His Pro Ala Pro Phe Thr Arg Gly Thr Gly Ala Thr			
	6290	6295	6300
Leu Thr Leu Val Gln Ala Leu Glu Asp Ala Gly Val Ala Ala Pro Leu			
	6305	6310	6315
10Trp Cys Val Thr His Gly Ala Val Ser Val Gly Arg Ala Asp His Val			
	6325	6330	6335
Thr Ser Pro Ala Gln Ala Met Val Trp Gly Met Gly Arg Val Ala Ala			
	6340	6345	6350
Leu Glu His Pro Glu Arg Trp Gly Gly Leu Ile Asp Leu Pro Ser Asp			
15	6355	6360	6365
Ala Asp Arg Ala Ala Leu Asp Arg Met Thr Thr Val Leu Ala Gly Gly			
	6370	6375	6380
Thr Gly Glu Asp Gln Val Ala Val Arg Ala Ser Gly Leu Leu Ala Arg			
	6385	6390	6395
20Arg Leu Val Arg Ala Ser Leu Pro Ala His Gly Thr Ala Ser Pro Trp			
	6405	6410	6415
Trp Gln Ala Asp Gly Thr Val Leu Val Thr Gly Ala Glu Glu Pro Ala			
	6420	6425	6430
Ala Ala Glu Ala Ala Arg Arg Leu Ala Arg Asp Gly Ala Gly His Leu			
25	6435	6440	6445
Leu Leu His Thr Thr Pro Ser Gly Ser Glu Gly Ala Glu Gly Thr Ser			
	6450	6455	6460
Gly Ala Ala Glu Asp Ser Gly Leu Ala Gly Leu Val Ala Glu Leu Ala			
	6465	6470	6475
30Asp Leu Gly Ala Thr Ala Thr Val Val Thr Cys Asp Leu Thr Asp Ala			
	6485	6490	6495
Glu Ala Ala Ala Arg Leu Leu Ala Gly Val Ser Asp Ala His Pro Leu			
	6500	6505	6510
Ser Ala Val Leu His Leu Pro Pro Thr Val Asp Ser Glu Pro Leu Ala			
35	6515	6520	6525
Ala Thr Asp Ala Asp Ala Leu Ala Arg Val Val Thr Ala Lys Ala Thr			
	6530	6535	6540
Ala Ala Leu His Leu Asp Arg Leu Leu Arg Glu Ala Ala Ala Ala Gly			
	6545	6550	6555
40Gly Arg Pro Pro Val Leu Val Leu Phe Ser Ser Val Ala Ala Ile Trp			
	6560		

[illegible]

	6885	6890	6895
	Met Asp Pro Gln Gln Arg Leu Leu Leu Glu Thr Ser Trp Glu Ala Val		
	6900	6905	6910
	Glu Asp Ala Gly Ile Asp Pro Thr Ser Leu Gln Gly Gln Gln Val Gly		
5	6915	6920	6925
	Val Phe Ala Gly Thr Asn Gly Pro His Tyr Glu Pro Leu Leu Arg Asn		
	6930	6935	6940
	Thr Ala Glu Asp Leu Glu Gly Tyr Val Gly Thr Gly Asn Ala Ala Ser		
	6945	6950	6955
10	Ile Met Ser Gly Arg Val Ser Tyr Thr Leu Gly Leu Glu Gly Pro Ala		
	6965	6970	6975
	Val Thr Val Asp Thr Ala Cys Ser Ser Ser Leu Val Ala Leu His Leu		
	6980	6985	6990
	Ala Val Gln Ala Leu Arg Lys Gly Glu Cys Gly Leu Ala Leu Ala Gly		
15	6995	7000	7005
	Gly Val Thr Val Met Ser Thr Pro Thr Thr Phe Val Glu Phe Ser Arg		
	7010	7015	7020
	Gln Arg Gly Leu Ala Glu Asp Gly Arg Ser Lys Ala Phe Ala Ala Ser		
	7025	7030	7035
20	Ala Asp Gly Phe Gly Pro Ala Glu Gly Val Gly Met Leu Leu Val Glu		
	7045	7050	7055
	Arg Leu Ser Asp Ala Arg Arg Asn Gly His Arg Val Leu Ala Val Val		
	7060	7065	7070
	Arg Gly Ser Ala Val Asn Gln Asp Gly Ala Ser Asn Gly Leu Thr Ala		
25	7075	7080	7085
	Pro Asn Gly Pro Ser Gln Gln Arg Val Ile Arg Arg Ala Leu Ala Asp		
	7090	7095	7100
	Ala Arg Leu Thr Thr Ala Asp Val Asp Val Val Glu Ala His Gly Thr		
	7105	7110	7115
30	Gly Thr Arg Leu Gly Asp Pro Ile Glu Ala Gln Ala Leu Ile Ala Thr		
	7125	7130	7135
	Tyr Gly Gln Gly Arg Asp Thr Glu Gln Pro Leu Arg Leu Gly Ser Leu		
	7140	7145	7150
	Lys Ser Asn Ile Gly His Thr Gln Ala Ala Ala Gly Val Ser Gly Ile		
35	7155	7160	7165
	Ile Lys Met Val Gln Ala Met Arg His Gly Val Leu Pro Lys Thr Leu		
	7170	7175	7180
	His Val Asp Arg Pro Ser Asp Gln Ile Asp Trp Ser Ala Gly Thr Val		
	7185	7190	7195
40	Glu Leu Leu Thr Glu Ala Met Asp Trp Pro Arg Lys Gln Glu Gly Gly		
	7200		

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	7205	7210	7215
	Leu Arg Arg Ala Ala Val Ser Ser Phe Gly Ile Ser Gly Thr Asn Ala		
	7220	7225	7230
	His Ile Val Leu Glu Glu Ala Pro Val Asp Glu Asp Ala Pro Ala Asp		
5	7235	7240	7245
	Glu Pro Ser Val Gly Gly Val Val Pro Trp Leu Val Ser Ala Lys Thr		
	7250	7255	7260
	Pro Ala Ala Leu Asp Ala Gln Ile Gly Arg Leu Ala Ala Phe Ala Ser		
	7265	7270	7275
10	Gln Gly Arg Thr Asp Ala Ala Asp Pro Gly Ala Val Ala Arg Val Leu		7280
	7285	7290	7295
	Ala Gly Gly Arg Ala Gln Phe Glu His Arg Ala Val Ala Leu Gly Thr		
	7300	7305	7310
	Gly Gln Asp Asp Leu Ala Ala Ala Leu Ala Ala Pro Glu Gly Leu Val		
15	7315	7320	7325
	Arg Gly Val Ala Ser Gly Val Gly Arg Val Ala Phe Val Phe Pro Gly		
	7330	7335	7340
	Gln Gly Thr Gln Trp Ala Gly Met Gly Ala Glu Leu Leu Asp Val Ser		
	7345	7350	7355
20	Lys Glu Phe Ala Ala Ala Met Ala Glu Cys Glu Ala Ala Leu Ala Pro		7360
	7365	7370	7375
	Tyr Val Asp Trp Ser Leu Glu Ala Val Val Arg Gln Ala Pro Gly Ala		
	7380	7385	7390
	Pro Thr Leu Glu Arg Val Asp Val Val Gln Pro Val Thr Phe Ala Val		
25	7395	7400	7405
	Met Val Ser Leu Ala Lys Val Trp Gln His His Gly Val Thr Pro Gln		
	7410	7415	7420
	Ala Val Val Gly His Ser Gln Gly Glu Ile Ala Ala Ala Tyr Val Ala		
	7425	7430	7435
30	Gly Ala Leu Ser Leu Asp Asp Ala Ala Arg Val Val Thr Leu Arg Ser		7440
	7445	7450	7455
	Lys Ser Ile Gly Ala His Leu Ala Gly Gln Gly Gly Met Leu Ser Leu		
	7460	7465	7470
	Ala Leu Ser Glu Ala Ala Val Val Glu Arg Leu Ala Gly Phe Asp Gly		
35	7475	7480	7485
	Leu Ser Val Ala Ala Val Asn Gly Pro Thr Ala Thr Val Val Ser Gly		
	7490	7495	7500
	Asp Pro Thr Gln Ile Gln Glu Leu Ala Gln Ala Cys Glu Ala Asp Gly		
	7505	7510	7515
40	Val Arg Ala Arg Ile Ile Pro Val Asp Tyr Ala Ser His Ser Ala His		7520

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	7525	7530	7535
	Val Glu Thr Ile Glu Ser Glu Leu Ala Asp Val Leu Ala Gly Leu Ser		
	7540	7545	7550
	Pro Gln Thr Pro Gln Val Pro Phe Phe Ser Thr Leu Glu Gly Ala Trp		
5	7555	7560	7565
	Ile Thr Glu Pro Ala Leu Asp Gly Gly Tyr Trp Tyr Arg Asn Leu Arg		
	7570	7575	7580
	His Arg Val Gly Phe Ala Pro Ala Val Glu Thr Leu Ala Thr Asp Glu		
	7585	7590	7595
10	Gly Phe Thr His Phe Val Glu Val Ser Ala His Pro Val Leu Thr Met		
	7605	7610	7615
	Ala Leu Pro Glu Thr Val Thr Gly Leu Gly Thr Leu Arg Arg Asp Asn		
	7620	7625	7630
	Gly Gly Gln His Arg Leu Thr Thr Ser Leu Ala Glu Ala Trp Ala Asn		
15	7635	7640	7645
	Gly Leu Thr Val Asp Trp Ala Ser Leu Leu Pro Thr Thr Thr Thr His		
	7650	7655	7660
	Pro Asp Leu Pro Thr Tyr Ala Phe Gln Thr Glu Arg Tyr Trp Pro Gln		
	7665	7670	7675
20	Pro Asp Leu Ser Ala Ala Gly Asp Ile Thr Ser Ala Gly Leu Gly Ala		
	7685	7690	7695
	Ala Glu His Pro Leu Leu Gly Ala Ala Val Ala Leu Ala Asp Ser Asp		
	7700	7705	7710
	Gly Cys Leu Leu Thr Gly Ser Leu Ser Leu Arg Thr His Pro Trp Leu		
25	7715	7720	7725
	Ala Asp His Ala Val Ala Gly Thr Val Leu Leu Pro Gly Thr Ala Phe		
	7730	7735	7740
	Val Glu Leu Ala Phe Arg Ala Gly Asp Gln Val Gly Cys Asp Leu Val		
	7745	7750	7755
30	Glu Glu Leu Thr Leu Asp Ala Pro Leu Val Leu Pro Arg Arg Gly Ala		
	7765	7770	7775
	Val Arg Val Gln Leu Ser Val Gly Ala Ser Asp Glu Ser Gly Arg Arg		
	7780	7785	7790
	Thr Phe Gly Leu Tyr Ala His Pro Glu Asp Ala Pro Gly Glu Ala Glu		
35	7795	7800	7805
	Trp Thr Arg His Ala Thr Gly Val Leu Ala Ala Arg Ala Asp Arg Thr		
	7810	7815	7820
	Ala Pro Val Ala Asp Pro Glu Ala Trp Pro Pro Pro Gly Ala Glu Pro		
	7825	7830	7835
40	Val Asp Val Asp Gly Leu Tyr Glu Arg Phe Ala Ala Asn Gly Tyr Gly		
			7840

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7845 7850 7855
 Tyr Gly Pro Leu Phe Gln Gly Val Arg Gly Val Trp Arg Arg Gly Asp
 7860 7865 7870
 Glu Val Phe Ala Asp Val Ala Leu Pro Ala Glu Val Ala Gly Ala Glu
 5 7875 7880 7885
 Gly Ala Arg Phe Gly Leu His Pro Ala Leu Leu Asp Ala Ala Val Gln
 7890 7895 7900
 Ala Ala Gly Ala Gly Arg Gly Val Arg Arg Gly His Ala Ala Val
 7905 7910 7915 7920
 10 Arg Leu Glu Arg Asp Leu Leu Tyr Ala Val Gly Ala Thr Ala Leu Arg
 7925 7930 7935
 Val Arg Leu Ala Pro Ala Gly Pro Asp Thr Val Ser Val Ser Ala Ala
 7940 7945 7950
 Asp Ser Ser Gly Gln Pro Val Phe Ala Ala Asp Ser Leu Thr Val Leu
 15 7955 7960 7965
 Pro Val Asp Pro Ala Gln Leu Ala Ala Phe Ser Asp Pro Thr Leu Asp
 7970 7975 7980
 Ala Leu His Leu Leu Glu Trp Thr Ala Trp Asp Gly Ala Ala Gln Ala
 7985 7990 7995 8000
 20 Leu Pro Gly Ala Val Val Leu Gly Gly Asp Ala Asp Gly Leu Ala Ala
 8005 8010 8015
 Ala Leu Arg Ala Gly Gly Thr Glu Val Leu Ser Phe Pro Asp Leu Thr
 8020 8025 8030
 Asp Leu Val Glu Ala Val Asp Arg Gly Glu Thr Pro Ala Pro Ala Thr
 25 8035 8040 8045
 Val Leu Val Ala Cys Pro Ala Ala Gly Pro Asp Gly Pro Glu His Val
 8050 8055 8060
 Arg Glu Ala Leu His Gly Ser Leu Ala Leu Met Gln Ala Trp Leu Ala
 8065 8070 8075 8080
 30 Asp Glu Arg Phe Thr Asp Gly Arg Leu Val Leu Val Thr Arg Asp Ala
 8085 8090 8095
 Val Ala Ala Arg Ser Gly Asp Gly Leu Arg Ser Thr Gly Gln Ala Ala
 8100 8105 8110
 Val Trp Gly Leu Gly Arg Ser Ala Gln Thr Glu Ser Pro Gly Arg Phe
 35 8115 8120 8125
 Val Leu Leu Asp Leu Ala Gly Glu Ala Arg Thr Ala Gly Asp Ala Thr
 8130 8135 8140
 Ala Gly Asp Gly Leu Thr Thr Gly Asp Ala Thr Val Gly Gly Thr Ser
 8145 8150 8155 8160
 40 Gly Asp Ala Ala Leu Gly Ser Ala Leu Ala Thr Ala Leu Gly Ser Gly

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	8165					8170					8175					
	Glu	Pro	Gln	Leu	Ala	Leu	Arg	Asp	Gly	Ala	Leu	Leu	Val	Pro	Arg	Leu
	8180					8185					8190					
	Ala	Arg	Ala	Ala	Ala	Pro	Ala	Ala	Ala	Asp	Gly	Leu	Ala	Ala	Ala	Asp
5	8195					8200					8205					
	Gly	Leu	Ala	Ala	Leu	Pro	Leu	Pro	Ala	Ala	Pro	Ala	Leu	Trp	Arg	Leu
	8210					8215					8220					
	Glu	Pro	Gly	Thr	Asp	Gly	Ser	Leu	Glu	Ser	Leu	Thr	Ala	Ala	Pro	Gly
	8225					8230					8235					8240
10	Asp	Ala	Glu	Thr	Leu	Ala	Pro	Glu	Pro	Leu	Gly	Pro	Gly	Gln	Val	Arg
	8245					8250					8255					
	Ile	Ala	Ile	Arg	Ala	Thr	Gly	Leu	Asn	Phe	Arg	Asp	Val	Leu	Ile	Ala
	8260					8265					8270					
	Leu	Gly	Met	Tyr	Pro	Asp	Pro	Ala	Leu	Met	Gly	Thr	Glu	Gly	Ala	Gly
15	8275					8280					8285					
	Val	Val	Thr	Ala	Thr	Gly	Pro	Gly	Val	Thr	His	Leu	Ala	Pro	Gly	Asp
	8290					8295					8300					
	Arg	Val	Met	Gly	Leu	Leu	Ser	Gly	Ala	Tyr	Ala	Pro	Val	Val	Val	Ala
	8305					8310					8315					8320
20	Asp	Ala	Arg	Thr	Val	Ala	Arg	Met	Pro	Glu	Gly	Trp	Thr	Phe	Ala	Gln
	8325					8330					8335					
	Gly	Ala	Ser	Val	Pro	Val	Val	Phe	Leu	Thr	Ala	Val	Tyr	Ala	Leu	Arg
	8340					8345					8350					
	Asp	Leu	Ala	Asp	Val	Lys	Pro	Gly	Glu	Arg	Leu	Leu	Val	His	Ser	Ala
25	8355					8360					8365					
	Ala	Gly	Gly	Val	Gly	Met	Ala	Ala	Val	Gln	Leu	Ala	Arg	His	Trp	Gly
	8370					8375					8380					
	Val	Glu	Val	His	Gly	Thr	Ala	Ser	His	Gly	Lys	Trp	Asp	Ala	Leu	Arg
	8385					8390					8395					8400
30	Ala	Leu	Gly	Leu	Asp	Asp	Ala	His	Ile	Ala	Ser	Ser	Arg	Thr	Leu	Asp
	8405					8410					8415					
	Phe	Glu	Ser	Ala	Phe	Arg	Ala	Ala	Ser	Gly	Gly	Ala	Gly	Met	Asp	Val
	8420					8425					8430					
	Val	Leu	Asn	Ser	Leu	Ala	Arg	Glu	Phe	Val	Asp	Ala	Ser	Leu	Arg	Leu
35	8435					8440					8445					
	Leu	Gly	Pro	Gly	Gly	Arg	Phe	Val	Glu	Met	Gly	Lys	Thr	Asp	Val	Arg
	8450					8455					8460					
	Asp	Ala	Glu	Arg	Val	Ala	Ala	Asp	His	Pro	Gly	Val	Gly	Tyr	Arg	Ala
	8465					8470					8475					8480
40	Phe	Asp	Leu	Gly	Glu	Ala	Gly	Pro	Glu	Arg	Ile	Gly	Glu	Met	Leu	Ala

	8485	8490	8495
	Glu Val Ile Ala Leu Phe Glu Asp Gly Val Leu Arg His Leu Pro Val		
	8500	8505	8510
	Thr Thr Trp Asp Val Arg Arg Ala Arg Asp Ala Phe Arg His Val Ser		
5	8515	8520	8525
	Gln Ala Arg His Thr Gly Lys Val Val Leu Thr Met Pro Ser Gly Leu		
	8530	8535	8540
	Asp Pro Glu Gly Thr Val Leu Leu Thr Gly Gly Thr Gly Ala Leu Gly		
	8545	8550	8555
10	Gly Ile Val Ala Arg His Val Val Gly Glu Trp Gly Val Arg Arg Leu		
	8565	8570	8575
	Leu Leu Val Ser Arg Arg Gly Thr Asp Ala Pro Gly Ala Gly Glu Leu		
	8580	8585	8590
	Val His Glu Leu Glu Ala Leu Gly Ala Asp Val Ser Val Ala Ala Cys		
15	8595	8600	8605
	Asp Val Ala Asp Arg Glu Ala Leu Thr Ala Val Leu Asp Ser Ile Pro		
	8610	8615	8620
	Ala Glu His Pro Leu Thr Ala Val Val His Thr Ala Gly Val Leu Ser		
	8625	8630	8635
20	Asp Gly Thr Leu Pro Ser Met Thr Ala Glu Asp Val Glu His Val Leu		
	8645	8650	8655
	Arg Pro Lys Val Asp Ala Ala Phe Leu Leu Asp Glu Leu Thr Ser Thr		
	8660	8665	8670
	Pro Gly Tyr Asp Leu Ala Ala Phe Val Met Phe Ser Ser Ala Ala Ala		
25	8675	8680	8685
	Val Phe Gly Gly Ala Gly Gln Gly Ala Tyr Ala Ala Ala Asn Ala Thr		
	8690	8695	8700
	Leu Asp Ala Leu Ala Trp Arg Arg Arg Thr Ala Gly Leu Pro Ala Leu		
	8705	8710	8715
30	Ser Leu Gly Trp Gly Leu Trp Ala Glu Thr Ser Gly Met Thr Gly Gly		
	8725	8730	8735
	Leu Ser Asp Thr Asp Arg Ser Arg Leu Ala Arg Ser Gly Ala Thr Pro		
	8740	8745	8750
	Met Asp Ser Glu Leu Thr Leu Ser Leu Leu Asp Ala Ala Met Arg Arg		
35	8755	8760	8765
	Asp Asp Pro Ala Leu Val Pro Ile Ala Leu Asp Val Ala Ala Leu Arg		
	8770	8775	8780
	Ala Gln Gln Arg Asp Gly Met Leu Ala Pro Leu Leu Ser Gly Leu Thr		
	8785	8790	8795
40	Arg Gly Ser Arg Val Gly Gly Ala Pro Val Asn Gln Arg Arg Ala Ala		
	8800		

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	8805	8810	8815
	Ala Gly Gly Ala Gly Glu Ala Asp Thr Asp Leu Gly Gly Arg Leu Ala		
	8820	8825	8830
	Ala Met Thr Pro Asp Asp Arg Val Ala His Leu Arg Asp Leu Val Arg		
5	8835	8840	8845
	Thr His Val Ala Thr Val Leu Gly His Gly Thr Pro Ser Arg Val Asp		
	8850	8855	8860
	Leu Glu Arg Ala Phe Arg Asp Thr Gly Phe Asp Ser Leu Thr Ala Val		
	8865	8870	8875
	8880		
10	Glu Leu Arg Asn Arg Leu Asn Ala Ala Thr Gly Leu Arg Leu Pro Ala		
	8885	8890	8895
	Thr Leu Val Phe Asp His Pro Thr Pro Gly Glu Leu Ala Gly His Leu		
	8900	8905	8910
	Leu Asp Glu Leu Ala Thr Ala Ala Gly Gly Ser Trp Ala Glu Gly Thr		
15	8915	8920	8925
	Gly Ser Gly Asp Thr Ala Ser Ala Thr Asp Arg Gln Thr Thr Ala Ala		
	8930	8935	8940
	Leu Ala Glu Leu Asp Arg Leu Glu Gly Val Leu Ala Ser Leu Ala Pro		
	8945	8950	8955
	8960		
20	Ala Ala Gly Gly Arg Pro Glu Leu Ala Ala Arg Leu Arg Ala Leu Ala		
	8965	8970	8975
	Ala Ala Leu Gly Asp Asp Gly Asp Asp Ala Thr Asp Leu Asp Glu Ala		
	8980	8985	8990
	Ser Asp Asp Asp Leu Phe Ser Phe Ile Asp Lys Glu Leu Gly Asp Ser		
25	8995	9000	9005
	Asp Phe Met Ala Asn Asn Glu Asp Lys Leu Arg Asp Tyr Leu Lys Arg		
	9010	9015	9020
	Val Thr Ala Glu Leu Gln Gln Asn Thr Arg Arg Leu Arg Glu Ile Glu		
	9025	9030	9035
	9040		
30	Gly Arg Thr His Glu Pro Val Ala Ile Val Gly Met Ala Cys Arg Leu		
	9045	9050	9055
	Pro Gly Gly Val Ala Ser Pro Glu Asp Leu Trp Gln Leu Val Ala Gly		
	9060	9065	9070
	Asp Gly Asp Ala Ile Ser Glu Phe Pro Gln Asp Arg Gly Trp Asp Val		
35	9075	9080	9085
	Glu Gly Leu Tyr Asp Pro Asp Pro Asp Ala Ser Gly Arg Thr Tyr Cys		
	9090	9095	9100
	Arg Ser Gly Gly Phe Leu His Asp Ala Gly Glu Phe Asp Ala Asp Phe		
	9105	9110	9115
	9120		
40	Phe Gly Ile Ser Pro Arg Glu Ala Leu Ala Met Asp Pro Gln Gln Arg		

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					9125					9130					9135	
	Leu	Ser	Leu	Thr	Thr	Ala	Trp	Glu	Ala	Ile	Glu	Ser	Ala	Gly	Ile	Asp
					9140					9145					9150	
	Pro	Thr	Ala	Leu	Lys	Gly	Ser	Gly	Leu	Gly	Val	Phe	Val	Gly	Gly	Trp
5					9155					9160					9165	
	His	Thr	Gly	Tyr	Thr	Ser	Gly	Gln	Thr	Thr	Ala	Val	Gln	Ser	Pro	Glu
					9170					9175				9180		
	Leu	Glu	Gly	His	Leu	Val	Ser	Gly	Ala	Ala	Leu	Gly	Phe	Leu	Ser	Gly
	9185					9190						9195				9200
10	Arg	Ile	Ala	Tyr	Val	Leu	Gly	Thr	Asp	Gly	Pro	Ala	Leu	Thr	Val	Asp
					9205						9210				9215	
	Thr	Ala	Cys	Ser	Ser	Ser	Leu	Val	Ala	Leu	His	Leu	Ala	Val	Gln	Ala
					9220					9225				9230		
	Leu	Arg	Lys	Gly	Glu	Cys	Asp	Met	Ala	Leu	Ala	Gly	Gly	Val	Thr	Val
15					9235					9240				9245		
	Met	Pro	Asn	Ala	Asp	Leu	Phe	Val	Gln	Phe	Ser	Arg	Gln	Arg	Gly	Leu
					9250					9255				9260		
	Ala	Ala	Asp	Gly	Arg	Ser	Lys	Ala	Phe	Ala	Thr	Ser	Ala	Asp	Gly	Phe
	9265					9270						9275				9280
20	Gly	Pro	Ala	Glu	Gly	Ala	Gly	Val	Leu	Leu	Val	Glu	Arg	Leu	Ser	Asp
					9285						9290				9295	
	Ala	Arg	Arg	Asn	Gly	His	Arg	Ile	Leu	Ala	Val	Val	Arg	Gly	Ser	Ala
					9300					9305				9310		
	Val	Asn	Gln	Asp	Gly	Ala	Ser	Asn	Gly	Leu	Thr	Ala	Pro	His	Gly	Pro
25					9315					9320				9325		
	Ser	Gln	Gln	Arg	Val	Ile	Arg	Arg	Ala	Leu	Ala	Asp	Ala	Arg	Leu	Ala
					9330					9335				9340		
	Pro	Gly	Asp	Val	Asp	Val	Val	Glu	Ala	His	Gly	Thr	Gly	Thr	Arg	Leu
	9345					9350						9355				9360
30	Gly	Asp	Pro	Ile	Glu	Ala	Gln	Ala	Leu	Ile	Ala	Thr	Tyr	Gly	Gln	Glu
					9365						9370				9375	
	Lys	Ser	Ser	Glu	Gln	Pro	Leu	Arg	Leu	Gly	Ala	Leu	Lys	Ser	Asn	Ile
					9380					9385				9390		
	Gly	His	Thr	Gln	Ala	Ala	Ala	Gly	Val	Ala	Gly	Val	Ile	Lys	Met	Val
35					9395					9400				9405		
	Gln	Ala	Met	Arg	His	Gly	Leu	Leu	Pro	Lys	Thr	Leu	His	Val	Asp	Glu
					9410					9415				9420		
	Pro	Ser	Asp	Gln	Ile	Asp	Trp	Ser	Ala	Gly	Thr	Val	Glu	Leu	Leu	Thr
	9425					9430						9435				9440
40	Glu	Ala	Val	Asp	Trp	Pro	Glu	Lys	Gln	Asp	Gly	Gly	Leu	Arg	Arg	Ala

	9445	9450	9455
Ala Val Ser Ser Phe Gly Ile Ser Gly Thr Asn Ala His Val Val Leu			
	9460	9465	9470
Glu Glu Ala Pro Ala Val Glu Asp Ser Pro Ala Val Glu Pro Pro Ala			
5	9475	9480	9485
Gly Gly Gly Val Val Pro Trp Pro Val Ser Ala Lys Thr Pro Ala Ala			
	9490	9495	9500
Leu Asp Ala Gln Ile Gly Gln Leu Ala Ala Tyr Ala Asp Gly Arg Thr			
	9505	9510	9515
10 Asp Val Asp Pro Ala Val Ala Ala Arg Ala Leu Val Asp Ser Arg Thr			
	9525	9530	9535
Ala Met Glu His Arg Ala Val Ala Val Gly Asp Ser Arg Glu Ala Leu			
	9540	9545	9550
Arg Asp Ala Leu Arg Met Pro Glu Gly Leu Val Arg Gly Thr Ser Ser			
15	9555	9560	9565
Asp Val Gly Arg Val Ala Phe Val Phe Pro Gly Gln Gly Thr Gln Trp			
	9570	9575	9580
Ala Gly Met Gly Ala Glu Leu Leu Asp Ser Ser Pro Glu Phe Ala Ala			
	9585	9590	9595
20 Ser Met Ala Glu Cys Glu Thr Ala Leu Ser Arg Tyr Val Asp Trp Ser			
	9605	9610	9615
Leu Glu Ala Val Val Arg Gln Glu Pro Gly Ala Pro Thr Leu Asp Arg			
	9620	9625	9630
Val Asp Val Val Gln Pro Val Thr Phe Ala Val Met Val Ser Leu Ala			
25	9635	9640	9645
Lys Val Trp Gln His His Gly Ile Thr Pro Gln Ala Val Val Gly His			
	9650	9655	9660
Ser Gln Gly Glu Ile Ala Ala Ala Tyr Val Ala Gly Ala Leu Thr Leu			
	9665	9670	9675
30 Asp Asp Ala Ala Arg Val Val Thr Leu Arg Ser Lys Ser Ile Ala Ala			
	9685	9690	9695
His Leu Ala Gly Lys Gly Gly Met Ile Ser Leu Ala Leu Asp Glu Ala			
	9700	9705	9710
Ala Val Leu Lys Arg Leu Ser Asp Phe Asp Gly Leu Ser Val Ala Ala			
35	9715	9720	9725
Val Asn Gly Pro Thr Ala Thr Val Val Ser Gly Asp Pro Thr Gln Ile			
	9730	9735	9740
Glu Glu Leu Ala Arg Thr Cys Glu Ala Asp Gly Val Arg Ala Arg Ile			
	9745	9750	9755
40 Ile Pro Val Asp Tyr Ala Ser His Ser Arg Gln Val Glu Ile Ile Glu			
	9760		

	9765	9770	9775
	Lys Glu Leu Ala Glu Val Leu Ala Gly Leu Ala Pro Gln Ala Pro His		
	9780	9785	9790
	Val Pro Phe Phe Ser Thr Leu Glu Gly Thr Trp Ile Thr Glu Pro Val		
5	9795	9800	9805
	Leu Asp Gly Thr Tyr Trp Tyr Arg Asn Leu Arg His Arg Val Gly Phe		
	9810	9815	9820
	Ala Pro Ala Val Glu Thr Leu Ala Val Asp Gly Phe Thr His Phe Ile		
	9825	9830	9835
10	Glu Val Ser Ala His Pro Val Leu Thr Met Thr Leu Pro Glu Thr Val		
	9845	9850	9855
	Thr Gly Leu Gly Thr Leu Arg Arg Glu Gln Gly Gly Gln Glu Arg Leu		
	9860	9865	9870
	Val Thr Ser Leu Ala Glu Ala Trp Ala Asn Gly Leu Thr Ile Asp Trp		
15	9875	9880	9885
	Ala Pro Ile Leu Pro Thr Ala Thr Gly His His Pro Glu Leu Pro Thr		
	9890	9895	9900
	Tyr Ala Phe Gln Thr Glu Arg Phe Trp Leu Gln Ser Ser Ala Pro Thr		
	9905	9910	9915
20	Ser Ala Ala Asp Asp Trp Arg Tyr Arg Val Glu Trp Lys Pro Leu Thr		
	9925	9930	9935
	Ala Ser Gly Gln Ala Asp Leu Ser Gly Arg Trp Ile Val Ala Val Gly		
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	Ser Glu Pro Glu Ala Glu Leu Leu Gly Ala Leu Lys Ala Ala Gly Ala		
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	Glu Val Asp Val Leu Glu Ala Gly Ala Asp Asp Asp Arg Glu Ala Leu		
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	Leu Gly Asp Ala Gly Ile Lys Ala Pro Leu Trp Ser Val Thr Gln Gly		
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	Ala Val Ser Val Gly Arg Leu Asp Thr Pro Ala Asp Pro Asp Arg Ala		
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	Met Leu Trp Gly Leu Gly Arg Val Val Ala Leu Glu His Pro Glu Arg		
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	Trp Ala Gly Leu Val Asp Leu Pro Ala Gln Pro Asp Ala Ala Leu		
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Leu His Gly Arg Arg Pro Thr Arg Asp Trp Gln Pro His Gly Thr Val			
5 10115	10120	10125	
Leu Ile Thr Gly Gly Thr Gly Ala Leu Gly Ser His Ala Ala Arg Trp			
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Met Ala His His Gly Ala Glu His Leu Leu Leu Val Ser Arg Ser Gly			
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Gly Ala Arg Val Thr Ile Ala Ala Cys Asp Val Ala Asp Pro His Ala			
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Met Arg Thr Leu Leu Asp Ala Ile Pro Ala Glu Thr Pro Leu Thr Ala			
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Val Val His Thr Ala Gly Ala Pro Gly Gly Asp Pro Leu Asp Val Thr			
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Gly Pro Glu Asp Ile Ala Arg Ile Leu Gly Ala Lys Thr Ser Gly Ala			
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20Glu Val Leu Asp Asp Leu Leu Arg Gly Thr Pro Leu Asp Ala Phe Val			
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Leu Tyr Ser Ser Asn Ala Gly Val Trp Gly Ser Gly Ser Gln Gly Val			
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Tyr Ala Ala Ala Asn Ala His Leu Asp Ala Leu Ala Ala Arg Arg Arg			
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Ala Arg Gly Glu Thr Ala Thr Ser Val Ala Trp Gly Leu Trp Ala Gly			
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Asp Gly Met Gly Arg Gly Ala Asp Asp Ala Tyr Trp Gln Arg Arg Gly			
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30Ile Arg Pro Met Ser Pro Asp Arg Ala Leu Asp Glu Leu Ala Lys Ala			
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Leu Ser His Asp Glu Thr Phe Val Ala Val Ala Asp Val Asp Trp Glu			
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Arg Phe Ala Pro Ala Phe Thr Val Ser Arg Pro Ser Leu Leu Leu Asp			
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Gly Val Pro Glu Ala Arg Gln Ala Leu Ala Ala Pro Val Gly Ala Pro			
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	Thr Leu Val Arg Thr His Ala Ala Val Leu Gly His Ser Ser Pro		
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	Asp Arg Val Ala Pro Gly Arg Ala Phe Thr Glu Leu Gly Phe Asp Ser		
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	Leu Thr Ala Val Gln Leu Arg Asn Gln Leu Ser Thr Val Val Gly Asn		
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	Arg Leu Pro Ala Thr Thr Val Phe Asp His Pro Thr Pro Ala Ala Leu		
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	10480		
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	Thr Asp Trp Glu Gly Arg Val Arg Arg Ala Leu Ala Glu Leu Pro Leu		
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	Asp Arg Leu Arg Asp Ala Gly Val Leu Asp Thr Val Leu Arg Leu Thr		
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	Gly Ile Glu Pro Glu Pro Gly Ser Gly Gly Ser Asp Gly Gly Ala Ala		
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	Asp Pro Gly Ala Glu Pro Glu Ala Ser Ile Asp Asp Leu Asp Ala Glu		
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	10560		
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	Asn Glu Gln Leu Val Asp Ala Leu Arg Ala Ser Leu Lys Glu Asn Glu		
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	Glu Leu Arg Lys Glu Ser Arg Arg Arg Ala Asp Arg Arg Gln Glu Pro		
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	Met Ala Ile Val Gly Met Ser Cys Arg Phe Ala Gly Gly Ile Arg Ser		
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	Val Pro Gly Arg Lys Gly Thr Thr Tyr Val Arg Asn Ala Ala Phe Leu		
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	Asp Asp Ala Ala Gly Phe Asp Ala Ala Phe Phe Gly Ile Ser Pro Arg		
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	Glu Ala Leu Ala Met Asp Pro Gln Gln Arg Gln Leu Leu Glu Ala Ser		
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	Trp Glu Val Phe Glu Arg Ala Gly Ile Asp Pro Ala Ser Val Arg Gly		
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	10720		
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Asn Ser Ser Ala Val Ala Ser Gly Arg Ile Ala Tyr Ser Leu Gly Leu			
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Glu Gly Pro Ala Val Thr Val Asp Thr Ala Cys Ser Ser Ser Leu Val			
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Glu Phe Ser Ser Gln Gln Ala Met Ala Ala Asp Gly Arg Thr Lys Gly			
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Phe Ala Ser Ala Ala Asp Gly Leu Ala Trp Gly Glu Gly Val Ala Val			
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Leu Leu Leu Glu Arg Leu Ser Asp Ala Arg Arg Lys Gly His Arg Val			
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Gly His Gly Thr Gly Thr Arg Leu Gly Asp Pro Ile Glu Ala Gln Ala			
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Leu Leu Ala Thr Tyr Gly Gln Gly Arg Ala Pro Gly Gln Pro Leu Arg			
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Leu Gly Thr Leu Lys Ser Asn Ile Gly His Thr Gln Ala Ala Ser Gly			
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Pro Lys Thr Leu His Val Asp Glu Pro Thr Asp Gln Val Asp Trp Ser			
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Ala Gly Ser Val Glu Leu Leu Thr Glu Ala Val Asp Trp Pro Glu Arg			
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Pro Gly Arg Leu Arg Arg Ala Gly Val Ser Ala Phe Gly Val Gly Gly			
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Thr Asn Ala His Val Val Leu Glu Glu Ala Pro Ala Val Glu Glu Ser			
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	11045	11050	11055
Ser Ala Lys Thr Ser Ala Ala Leu Asp Ala Gln Ile Gly Gln Leu Ala			
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Ala Tyr Ala Glu Asp Arg Thr Asp Val Asp Pro Ala Val Ala Ala Arg			
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Gly Asp Ser Arg Glu Ala Leu Arg Asp Ala Leu Arg Met Pro Glu Gly			
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Pro Gly Gln Gly Thr Gln Trp Ala Gly Met Gly Ala Glu Leu Leu Asp			
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Ser Ser Pro Glu Phe Ala Ala Ala Met Ala Glu Cys Glu Thr Ala Leu			
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Ser Pro Tyr Val Asp Trp Ser Leu Glu Ala Val Val Arg Gln Ala Pro			
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Pro Glu Ala Val Ile Gly His Ser Gln Gly Glu Ile Ala Ala Ala Tyr			
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Val Ala Gly Ala Leu Thr Leu Asp Asp Ala Ala Arg Val Val Thr Leu			
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Arg Ser Lys Ser Ile Ala Ala His Leu Ala Gly Lys Gly Gly Met Ile			
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Ser Leu Ala Leu Ser Glu Glu Ala Thr Arg Gln Arg Ile Glu Asn Leu			
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30His Gly Leu Ser Ile Ala Ala Val Asn Gly Pro Thr Ala Thr Val Val			
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Asp Gly Ile Arg Ala Arg Ile Ile Pro Val Asp Tyr Ala Ser His Ser			
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Ala His Val Glu Thr Ile Glu Asn Glu Leu Ala Asp Val Leu Ala Gly			
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Leu Ser Pro Gln Thr Pro Gln Val Pro Phe Phe Ser Thr Leu Glu Gly			
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Glu Asp Gly Gly Gln His Arg Leu Thr Thr Ser Leu Ala Glu Ala Trp			
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Arg Ser Tyr Trp Ile Ser Pro Ala Gly Pro Gly Glu Ala Pro Ala His			
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Pro Gly Ala Glu Asp Leu Asp Glu Glu Gly Arg Arg Ser Ala Val Leu			
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Glu Glu Val Pro Val Asp Arg Pro Leu Arg Glu Ile Gly Phe Asp Ser			
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Leu Thr Ala Val Asp Phe Arg Asn Arg Val Asn Arg Leu Thr Gly Leu			
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Gln Leu Pro Pro Thr Val Val Phe Gln His Pro Thr Pro Val Ala Leu			
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	Thr Gly Thr Gly Thr Gly Thr Ala Leu Leu Pro Ala Asp Leu Asp Thr		
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	Leu Ala Phe Arg Leu Glu Arg Ala His Gly Ala Pro Pro Ala Gly Ile		
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	Val Leu Val Asp Pro Tyr Pro Pro Gly His Gln Glu Pro Ile Glu Val		
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	Phe Thr Met Met Arg Asp His Ala Pro Ala Val Ala Glu Ala Val Leu		
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	Pro Ala Pro Asn Ser Ala Val Arg Leu Val Cys Leu Pro His Ala Gly		
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	Gly Ser Ala Ser Tyr Phe Phe Arg Phe Ser Glu Glu Leu His Pro Ser		
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 30 Asn Gly Gly Pro Leu Val Arg Glu Phe Glu Glu Arg Val Ala Gly Leu
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 Ala Gly Val Arg His Ala Val Ala Thr Cys Asn Ala Thr Ala Gly Leu
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 Gln Leu Leu Ala His Ala Ala Gly Leu Thr Gly Glu Val Ile Met Pro
 35 85 90 95
 Ser Met Thr Phe Ala Ala Thr Pro His Ala Leu Arg Trp Ile Gly Leu
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 Glu Val Val Arg Asp Phe Val Glu Arg Gly Gly Glu Val Ala Ala Val
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20 <213> Streptomyces venezuelae

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40 <211> 292

<212> PRT

<213> Streptomyces venezuelae

<400> 12

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 10 35 40 45
 Ile Gln Ile Ile Ser Thr Pro Gln His Ile Glu Leu Phe Gln Ser Leu
 50 55 60
 Leu Gly Asn Gly Arg His Leu Gly Ile Glu Leu Asp Tyr Ala Val Gln
 65 70 75 80
 15 Lys Glu Pro Ala Gly Ile Ala Asp Ala Leu Leu Val Gly Ala Glu His
 85 90 95
 Ile Gly Asp Asp Thr Cys Ala Leu Ile Leu Gly Asp Asn Ile Phe His
 100 105 110
 Gly Pro Gly Leu Tyr Thr Leu Leu Arg Asp Ser Ile Ala Arg Leu Asp
 20 115 120 125
 Gly Cys Val Leu Phe Gly Tyr Pro Val Lys Asp Pro Glu Arg Tyr Gly
 130 135 140
 Val Ala Glu Val Asp Ala Thr Gly Arg Leu Thr Asp Leu Val Glu Lys
 145 150 155 160
 25 Pro Val Lys Pro Arg Ser Asn Leu Ala Val Thr Gly Leu Tyr Leu Tyr
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 Asp Asn Asp Val Val Asp Ile Ala Lys Asn Ile Arg Pro Ser Pro Arg
 180 185 190
 Gly Glu Leu Glu Ile Thr Asp Val Asn Arg Val Tyr Leu Glu Arg Gly
 30 195 200 205
 Arg Ala Glu Leu Val Asn Leu Gly Arg Gly Phe Ala Trp Leu Asp Thr
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 Gly Thr His Asp Ser Leu Leu Arg Ala Ala Gln Tyr Val Gln Val Leu
 225 230 235 240
 35 Glu Glu Arg Gln Gly Val Trp Ile Ala Gly Leu Glu Glu Ile Ala Phe
 245 250 255
 Arg Met Gly Phe Ile Asp Ala Glu Ala Cys His Gly Leu Gly Glu Gly
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098884
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Glu Gly Ala Pro

290

<210> 13

5 <211> 1014

<212> DNA

<213> Streptomyces venezuelae

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<211> 337

30 <212> PRT

<213> Streptomyces venezuelae

<400> 14

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 20 25 30
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<213> *Streptomyces venezuelae*

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 gccgtcggcg tgaacagcgg gatggacgcc ctccagctcg ccctccgcgg cctcggcatc 240
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<210> 16

<211> 379

<212> PRT

<213> *Streptomyces venezuelae*

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<400> 16

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 20 25 30
 35 Val Leu Asp Ser Gly Arg Tyr Leu Leu Gly Pro Glu Leu Glu Gly Phe
 35 40 45
 Glu Ala Glu Phe Ala Ala Tyr Cys Glu Thr Asp His Ala Val Gly Val
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 Asn Ser Gly Met Asp Ala Leu Gln Leu Ala Leu Arg Gly Leu Gly Ile
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093834 1199

40 <210> 17

<211> 714

<212> DNA

<213> Streptomyces venezuelae

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<211> 237

<212> PRT

<213> Streptomyces venezuelae

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 30 35 40 45
 Thr Gly Thr His Leu Glu His Phe Thr Lys Glu Phe Gly Asp Thr Ala
 50 55 60
 Gly Leu Glu Leu Ser Glu Asp Met Leu Thr His Ala Arg Lys Arg Leu
 65 70 75 80
 35 Pro Asp Ala Thr Leu His Gln Gly Asp Met Arg Asp Phe Arg Leu Gly
 85 90 95
 Arg Lys Phe Ser Ala Val Val Ser Met Phe Ser Ser Val Gly Tyr Leu
 100 105 110
 Lys Thr Thr Glu Glu Leu Gly Ala Val Ala Ser Phe Ala Glu His
 40 115 120 125

1058884.1190

Leu Glu Pro Gly Gly Val Val Val Val Glu Pro Trp Trp Phe Pro Glu
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 Thr Phe Ala Asp Gly Trp Val Ser Ala Asp Val Val Arg Arg Asp Gly
 145 150 155 160
 5 Arg Thr Val Ala Arg Val Ser His Ser Val Arg Glu Gly Asn Ala Thr
 165 170 175
 Arg Met Glu Val His Phe Thr Val Ala Asp Pro Gly Lys Gly Val Arg
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 His Phe Ser Asp Val His Leu Ile Thr Leu Phe His Gln Ala Glu Tyr
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 Glu Ala Ala Phe Thr Ala Ala Gly Leu Arg Val Glu Tyr Leu Glu Gly
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<210> 19
 <211> 1281
 <212> DNA
 <213> Streptomyces venezuelae

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<400> 19

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	Arg	Glu	Asp	Pro	Thr	Ala	Glu	Trp	Leu	Thr	Trp	Thr	Leu	Asp	Arg	Tyr
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Ser Glu Pro Pro Ala Arg Pro Arg Val Cys Leu Thr Leu Gly Val Ser
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 Ala Arg Glu Val Leu Gly Gly Asp Gly Val Ser Gln Gly Asp Ile Leu
 260 265 270
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 275 280 285
 Ser Gln Arg Ala Glu Ile Arg Asn Tyr Pro Lys His Thr Arg Phe Thr
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 Asp Phe Val Pro Met His Ala Leu Leu Pro Ser Cys Ser Ala Ile Ile
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 His His Gly Gly Ala Gly Thr Tyr Ala Thr Ala Val Ile Asn Ala Val
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 Pro Gln Val Met Leu Ala Glu Leu Trp Asp Ala Pro Val Lys Ala Arg
 340 345 350
 15 Ala Val Ala Glu Gln Gly Ala Gly Phe Phe Leu Pro Pro Ala Glu Leu
 355 360 365
 Thr Pro Gln Ala Val Arg Asp Ala Val Val Arg Ile Leu Asp Asp Pro
 370 375 380
 Ser Val Ala Thr Ala Ala His Arg Leu Arg Glu Glu Thr Phe Gly Asp
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<210> 21
 <211> 1209
 <212> DNA
 <213> Streptomyces venezuelae

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<400> 21

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<210> 22

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<212> PRT

<213> Streptomyces venezuelae

<400> 22

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 25 35 40 45
 Thr Val Leu Arg Gly Gln Ala Asp Asp Pro Tyr Pro Ala Tyr Glu Arg
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 Val Arg Ala Arg Gly Ala Leu Ser Phe Ser Pro Thr Gly Ser Trp Val
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 30 Thr Ala Asp His Ala Leu Ala Ala Ser Ile Leu Cys Ser Thr Asp Phe
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 Gly Val Ser Gly Ala Asp Gly Val Pro Val Pro Gln Gln Val Leu Ser
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 Tyr Gly Glu Gly Cys Pro Leu Glu Arg Glu Gln Val Leu Pro Ala Ala
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 Gly Asp Val Pro Glu Gly Gly Gln Arg Ala Val Val Glu Gly Ile His
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        <213> Streptomyces venezuelae

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<211> 809

<212> PRT

<213> Streptomyces venezuelae

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<400> 24

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Tyr Thr Ser Arg Ala Ala Glu Leu Val Ala Gln Met Thr Leu Asp Glu
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15 Lys Ile Ser Phe Val His Trp Ala Leu Asp Pro Asp Arg Gln Asn Val
65 70 75 80
Gly Tyr Leu Pro Gly Val Pro Arg Leu Gly Ile Pro Glu Leu Arg Ala
85 90 95
Ala Asp Gly Pro Asn Gly Ile Arg Leu Val Gly Gln Thr Ala Thr Ala
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Leu Pro Ala Pro Val Ala Leu Ala Ser Thr Phe Asp Asp Thr Met Ala
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Asp Ser Tyr Gly Lys Val Met Gly Arg Asp Gly Arg Ala Leu Asn Gln
130 135 140
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Gly Arg Asn Tyr Glu Thr Phe Ser Glu Asp Pro Leu Val Ser Ser Arg
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Thr Ala Lys His Phe Ala Ala Asn Asn Gln Glu Asn Asn Arg Phe Ser
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Val Asn Ala Asn Val Asp Glu Gln Thr Leu Arg Glu Ile Glu Phe Pro
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35 Ala Phe Glu Ala Ser Ser Lys Ala Gly Ala Ala Ser Phe Met Cys Ala
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Asn Asn Val Leu Arg Thr Gln Trp Gly Phe Gln Gly Trp Val Met Ser
40 260 265 270

090334 1191

Asp Trp Leu Ala Thr Pro Gly Thr Asp Ala Ile Thr Lys Gly Leu Asp
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 5 Ser Pro Pro Ala Lys Phe Phe Gly Glu Ala Leu Lys Thr Ala Val Leu
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 355 360 365
 Ala Glu Asn Gly Ala Val Leu Leu Arg Asn Glu Gly Gln Ala Leu Pro
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 385 390 395 400
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 405 410 415
 Ser Ala Ala Ala Pro Leu Asp Thr Ile Lys Ala Arg Ala Gly Ala Gly
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 Ala Thr Val Thr Tyr Glu Thr Gly Glu Glu Thr Phe Gly Thr Gln Ile
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 485 490 495
 Val Gln Leu Gly Ser His Thr Ile Glu Ala Gly Gln Val Tyr Gly Lys
 30 500 505 510
 Val Ser Ser Pro Leu Leu Lys Leu Thr Lys Gly Thr His Lys Leu Thr
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 Ile Ser Gly Phe Ala Met Ser Ala Thr Pro Leu Ser Leu Glu Leu Gly
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 35 Trp Val Thr Pro Ala Ala Ala Asp Ala Thr Ile Ala Lys Ala Val Glu
 545 550 555 560
 Ser Ala Arg Lys Ala Arg Thr Ala Val Val Phe Ala Tyr Asp Asp Gly
 565 570 575
 Thr Glu Gly Val Asp Arg Pro Asn Leu Ser Leu Pro Gly Thr Gln Asp
 40 580 585 590

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Lys Leu Ile Ser Ala Val Ala Asp Ala Asn Pro Asn Thr Ile Val Val
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 690 695 700
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 20 740 745 750
 Ala Ser Pro Asn Val Thr Ala Pro Gln Ala Lys Lys Lys Leu Val Gly
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 Tyr Thr Lys Val Ser Leu Ala Ala Gly Glu Ala Lys Thr Val Thr Val
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 25 Asn Val Asp Arg Arg Gln Leu Gln Thr Gly Ser Ser Ser Ala Asp Leu
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Leu Leu Asp Val Ala Cys Gly Thr Gly

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<210> 26

<211> 1011

<212> DNA

<213> Streptomyces venezuelae

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<400> 26

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<211> 336

<212> PRT

<213> Streptomyces venezuelae

<400> 27

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10

15

Arg Arg Glu Leu Gly Gln Asn Phe Leu Gln Asp Asp Arg Ala Val Arg

20

25

30

Asn Leu Val Thr His Val Glu Gly Asp Gly Arg Asn Val Leu Glu Ile

40

35

40

45

Gly Pro Gly Lys Gly Ala Ile Thr Glu Glu Leu Val Arg Ser Phe Asp
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 5 Arg Lys Phe Glu Gly Glu Arg Val Thr Val Phe Gln Gly Asp Phe Leu
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 Ala Gly Arg Ser Gly Gly Ser Leu Leu Thr Thr Ser Trp Ala Pro Trp
 145 150 155 160
 15 Tyr Glu Phe Ala Val His Asp Arg Val Arg Ala Ser Ser Phe Arg Pro
 165 170 175
 Met Pro Arg Val Asp Gly Gly Val Leu Thr Ile Arg Arg Arg Pro Gln
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 Pro Leu Leu Pro Glu Ser Ala Ser Arg Ala Phe Gln Asn Phe Ala Glu
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 Ala Val Phe Thr Gly Pro Gly Arg Gly Leu Ala Glu Ile Leu Arg Arg
 210 215 220
 His Ile Pro Lys Arg Thr Tyr Arg Ser Leu Ala Asp Arg His Gly Ile
 225 230 235 240
 25 Pro Asp Gly Gly Leu Pro Lys Asp Leu Thr Leu Thr Gln Trp Ile Ala
 245 250 255
 Leu Phe Gln Ala Ser Gln Pro Ser Tyr Ala Pro Gly Ala Pro Gly Thr
 260 265 270
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 Glu Thr Ser Arg Ala Ala Val Pro Gly Ser Arg Arg Tyr Gly Pro Thr
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<211> 969

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<212> DNA

00988384-11901

<213> Streptomyces venezuelae

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<211> 322

<212> PRT

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 35 40 45
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 35 50 55 60
 Gly Arg Arg Ala Gln Arg Leu Gly Ala Arg Thr Pro Gly His Val Thr
 65 70 75 80
 Val Val His His Asp Phe Leu Gln Tyr Pro Leu Pro Arg Asn Pro His
 85 90 95
 40 Val Val Val Gly Asn Val Pro Phe His Leu Thr Thr Ala Ile Met Arg

0988384 11901

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	Thr Ala Gly Trp Ala Pro Trp Tyr Glu Phe Asp Leu His Ser Arg Val		
	145	150	155
	Pro Ala Arg Ala Phe Arg Pro Met Pro Gly Val Asp Gly Gly Val Leu		
	165	170	175
10	Ala Ile Arg Arg Arg Ser Ala Pro Leu Val Gly Gln Val Lys Thr Tyr		
	180	185	190
	Gln Asp Phe Val Arg Gln Val Phe Thr Gly Lys Gly Asn Gly Leu Lys		
	195	200	205
	Glu Ile Leu Arg Arg Thr Gly Arg Ile Ser Gln Arg Asp Leu Ala Thr		
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	Trp Leu Arg Arg Asn Glu Ile Ser Pro His Ala Leu Pro Lys Asp Leu		
	225	230	235
	Lys Pro Gly Gln Trp Ala Ser Leu Trp Glu Leu Thr Gly Gly Thr Ala		
	245	250	255
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	Gly Ala Ala Arg Val Gly Ala Gly His Pro Gly Gly Arg Val Ser Ala		
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	Ser Arg Arg Gly Val Pro Gln Ala Arg Arg Gly Arg Gly His Ala Val		
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<211> 13842

<212> DNA

<213> *Streptomyces venezuelae*

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35

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Gly Arg Gly Ala Ala Ala Trp Asp Thr Gly Glu Val Arg Val Arg Arg
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	Ala	Pro	Thr	Gly	Asp	Val	Arg	Ala	Glu	Leu	Ile	Arg	Gly	Glu	Met	Ser		
	50						55						60					
5	Thr	Val	Ser	Lys	Ser	Glu	Ser	Glu	Glu	Phe	Val	Ser	Val	Ser	Asn	Asp		
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	Ala	Gly	Ser	Ala	His	Gly	Thr	Ala	Glu	Pro	Val	Ala	Val	Val	Gly	Ile		
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	Ser	Cys	Arg	Val	Pro	Gly	Ala	Arg	Asp	Pro	Arg	Glu	Phe	Trp	Glu	Leu		
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	Leu	Ala	Ala	Gly	Gly	Gln	Ala	Val	Thr	Asp	Val	Pro	Ala	Asp	Arg	Trp		
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	Asn	Ala	Gly	Asp	Phe	Tyr	Asp	Pro	Asp	Arg	Ser	Ala	Pro	Gly	Arg	Ser		
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	Ala	Phe	Phe	Gly	Ile	Ser	Pro	Arg	Glu	Ala	Ala	Glu	Met	Asp	Pro	Gln		
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	Gln	Arg	Leu	Ala	Leu	Glu	Leu	Gly	Trp	Glu	Ala	Leu	Glu	Arg	Ala	Gly		
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25	Ala	Ile	Thr	Pro	His	Thr	Val	Thr	Gly	Leu	His	Arg	Gly	Ile	Ile	Ala		
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	Asn	Arg	Leu	Ser	Tyr	Thr	Leu	Gly	Leu	Arg	Gly	Pro	Ser	Met	Val	Val		
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Phe Ala Ala Ala Met Ala Glu Cys Glu Ala Ala Leu Ser Pro Tyr Val
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	Val	Gly	His	Ser	Gln	Gly	Glu	Ile	Ala	Ala	Ala	Tyr	Val	Ala	Gly	Ala	
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 Thr Leu Arg Arg Glu Gln Gly Gly Gln Glu Arg Leu Val Thr Ser Leu
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1900

His Ala Met Arg Thr Leu Leu Asp Ala Ile Pro Ala Glu Thr Pro Leu
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 2290 2295 2300
 5 Thr Leu Thr Ala Glu Gln Val Arg Arg Ala His Arg Ala Lys Ala Val
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Ala Glu Ala Ala Leu Leu Asp Glu Thr Arg Tyr Thr Gin Cys Ala Leu	3235	3240	3245
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5 Arg Pro Ala Ala Leu Leu Gly His Ser Val Gly Glu Ile Ala Ala Ala	3265	3270	3275 3280
His Val Ala Gly Val Phe Ser Leu Ala Asp Ala Ala Arg Leu Val Ala	3285	3290	3295
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 35 40 45
 25 Gly Gly Val Ala Ser Pro Glu Asp Leu Trp Arg Leu Val Ala Gly Gly
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 Glu Asp Ala Ile Ser Glu Phe Pro Gln Asp Arg Gly Trp Asp Val Glu
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 Gly Leu Tyr Asp Pro Asn Pro Glu Ala Thr Gly Lys Ser Tyr Ala Arg
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 Glu Ala Gly Phe Leu Tyr Glu Ala Gly Glu Phe Asp Ala Asp Phe Phe
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 Gly Ile Ser Pro Arg Glu Ala Leu Ala Met Asp Pro Gln Gln Arg Leu
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 Ala Thr Ala Arg Gly Thr Ser Val Gly Val Phe Thr Gly Val Met Tyr
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 His Asp Tyr Ala Thr Arg Leu Thr Asp Val Pro Glu Gly Ile Glu Gly
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1900

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	545					550					555					560
	Arg	Gly	Thr	Pro	Ser	Asp	Val	Gly	Arg	Val	Ala	Phe	Val	Phe	Pro	Gly
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	Met	Val	Ser	Leu	Ala	Lys	Val	Trp	Gln	His	His	Gly	Val	Thr	Pro	Gln
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	Gly	Ala	Leu	Thr	Leu	Asp	Asp	Ala	Ala	Arg	Val	Val	Thr	Leu	Arg	Ser
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	690						695					700				
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	Leu	Ser	Ile	Ala	Ala	Val	Asn	Gly	Pro	Thr	Ala	Thr	Val	Val	Ser	Gly
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	Asp	Pro	Thr	Gln	Ile	Gln	Glu	Leu	Ala	Gln	Ala	Cys	Glu	Ala	Asp	Gly
			740					745				750				
	Val	Arg	Ala	Arg	Ile	Ile	Pro	Val	Asp	Tyr	Ala	Ser	His	Ser	Ala	His
		755					760					765				
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	770						775					780				
	Pro	Arg	Thr	Pro	Glu	Val	Pro	Phe	Phe	Ser	Thr	Leu	Glu	Gly	Ala	Trp
	785					790					795					800
	Ile	Thr	Glu	Pro	Val	Leu	Asp	Gly	Thr	Tyr	Trp	Tyr	Arg	Asn	Leu	Arg
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His Arg Val Gly Phe Ala Pro Ala Val Glu Thr Leu Ala Thr Asp Glu
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 Gly Phe Thr His Phe Ile Glu Val Ser Ala His Pro Val Leu Thr Met
 835 840 845
 5 Thr Leu Pro Glu Thr Val Thr Gly Leu Gly Thr Leu Arg Arg Glu Gln
 850 855 860
 Gly Gly Gln Glu Arg Leu Val Thr Ser Leu Ala Glu Ala Trp Thr Asn
 865 870 875 880
 Gly Leu Thr Ile Asp Trp Ala Pro Val Leu Pro Thr Ala Thr Gly His
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 His Pro Glu Leu Pro Thr Tyr Ala Phe Gln Arg Arg His Tyr Trp Leu
 900 905 910
 His Asp Ser Pro Ala Val Gln Gly Ser Val Gln Asp Ser Trp Arg Tyr
 915 920 925
 15 Arg Ile Asp Trp Lys Arg Leu Ala Val Ala Asp Ala Ser Glu Arg Ala
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 Gly Leu Ser Gly Arg Trp Leu Val Val Val Pro Glu Asp Arg Ser Ala
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 Glu Ala Ala Pro Val Leu Ala Ala Leu Ser Gly Ala Gly Ala Asp Pro
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 Val Gln Leu Asp Val Ser Pro Leu Gly Asp Arg Gln Arg Leu Ala Ala
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 Thr Leu Gly Glu Ala Leu Ala Ala Ala Gly Gly Ala Val Asp Gly Val
 995 1000 1005
 25 Leu Ser Leu Leu Ala Trp Asp Glu Ser Ala His Pro Gly His Pro Ala
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 Glu Asp Ala Gly Val Ala Ala Pro Leu Trp Cys Val Thr His Gly Ala
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 Val Trp Gly Met Gly Arg Val Ala Ala Leu Glu His Pro Glu Arg Trp
 1075 1080 1085
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 1090 1095 1100
 Arg Met Thr Thr Val Leu Ala Gly Gly Thr Gly Glu Asp Gln Val Ala
 1105 1110 1115 1120
 Val Arg Ala Ser Gly Leu Leu Ala Arg Arg Leu Val Arg Ala Ser Leu
 40 1125 1130 1135

098834 11901

Pro Ala His Gly Thr Ala Ser Pro Trp Trp Gln Ala Asp Gly Thr Val
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Leu Val Thr Gly Ala Glu Glu Pro Ala Ala Ala Glu Ala Ala Arg Arg
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5 Leu Ala Arg Asp Gly Ala Gly His Leu Leu Leu His Thr Thr Pro Ser
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Gly Ser Glu Gly Ala Glu Gly Thr Ser Gly Ala Ala Glu Asp Ser Gly
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Leu Ala Gly Leu Val Ala Glu Leu Ala Asp Leu Gly Ala Thr Ala Thr
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Val Val Thr Cys Asp Leu Thr Asp Ala Glu Ala Ala Ala Arg Leu Leu
1220 1225 1230

Ala Gly Val Ser Asp Ala His Pro Leu Ser Ala Val Leu His Leu Pro
1235 1240 1245

15 Pro Thr Val Asp Ser Glu Pro Leu Ala Ala Thr Asp Ala Asp Ala Leu
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Ala Arg Val Val Thr Ala Lys Ala Thr Ala Ala Leu His Leu Asp Arg
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Leu Leu Arg Glu Ala Ala Ala Ala Gly Gly Arg Pro Pro Val Leu Val
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Leu Phe Ser Ser Val Ala Ala Ile Trp Gly Gly Ala Gly Gln Gly Ala
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Tyr Ala Ala Gly Thr Ala Phe Leu Asp Ala Leu Ala Gly Gln His Arg
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25 Ala Asp Gly Pro Thr Val Thr Ser Val Ala Trp Ser Pro Trp Glu Gly
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Ser Arg Val Thr Glu Gly Ala Thr Gly Glu Arg Leu Arg Arg Leu Gly
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Leu Arg Pro Leu Ala Pro Ala Thr Ala Leu Thr Ala Leu Asp Thr Ala
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Leu Gly His Gly Asp Thr Ala Val Thr Ile Ala Asp Val Asp Trp Ser
1380 1385 1390

Ser Phe Ala Pro Gly Phe Thr Thr Ala Arg Pro Gly Thr Leu Leu Ala
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35 Asp Leu Pro Glu Ala Arg Arg Ala Leu Asp Glu Gln Gln Ser Thr Thr
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Ala Ala Asp Asp Thr Val Leu Ser Arg Glu Leu Gly Ala Leu Thr Gly
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Ala Glu Gln Gln Arg Arg Met Gln Glu Leu Val Arg Glu His Leu Ala
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10571 433660

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Asp	Tyr	Pro	Thr	Pro	Arg	Thr	Leu	Ala	Glu	Phe	Leu	Leu	Ala	Glu	Ile
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Leu	Gly	Glu	Gln	Ala	Gly	Ala	Gly	Glu	Gln	Leu	Pro	Val	Asp	Gly	Gly
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Val	Asp	Asp	Glu	Pro	Val	Ala	Ile	Val	Gly	Met	Ala	Cys	Arg	Leu	Pro
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Gly	Gly	Val	Ala	Ser	Pro	Glu	Asp	Leu	Trp	Arg	Leu	Val	Ala	Gly	Gly
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Gly	Leu	Tyr	Asp	Pro	Asp	Pro	Asp	Ala	Ser	Gly	Arg	Thr	Tyr	Cys	Arg
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Ala	Gly	Gly	Phe	Leu	Asp	Glu	Ala	Gly	Glu	Phe	Asp	Ala	Asp	Phe	Phe
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Leu	Leu	Glu	Thr	Ser	Trp	Glu	Ala	Val	Glu	Asp	Ala	Gly	Ile	Asp	Pro
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25	Thr	Ser	Leu	Gln	Gly	Gln	Gln	Val	Gly	Val	Phe	Ala	Gly	Thr	Gly
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Pro	His	Tyr	Glu	Pro	Leu	Leu	Arg	Asn	Thr	Ala	Glu	Asp	Leu	Glu	Gly
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Tyr	Val	Gly	Thr	Gly	Asn	Ala	Ala	Ser	Ile	Met	Ser	Gly	Arg	Val	Ser
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Ser	Ser	Ser	Leu	Val	Ala	Leu	His	Leu	Ala	Val	Gln	Ala	Leu	Arg	Lys
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Pro	Thr	Thr	Phe	Val	Glu	Phe	Ser	Arg	Gln	Arg	Gly	Leu	Ala	Glu	Asp
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Ala Glu Cys Glu Ala Ala Leu Ala Pro Tyr Val Asp Trp Ser Leu Glu
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Ala Val Val Arg Gln Ala Pro Gly Ala Pro Thr Leu Glu Arg Val Asp
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5 Val Val Gln Pro Val Thr Phe Ala Val Met Val Ser Leu Ala Lys Val
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Trp Gln His His Gly Val Thr Pro Gln Ala Val Val Gly His Ser Gln
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Gly Glu Ile Ala Ala Ala Tyr Val Ala Gly Ala Leu Ser Leu Asp Asp
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Ala Ala Arg Val Val Thr Leu Arg Ser Lys Ser Ile Gly Ala His Leu
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Ala Gly Gln Gly Gly Met Leu Ser Leu Ala Leu Ser Glu Ala Ala Val
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Leu Ala Gln Ala Cys Glu Ala Asp Gly Val Arg Ala Arg Ile Ile Pro
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Val Asp Tyr Ala Ser His Ser Ala His Val Glu Thr Ile Glu Ser Glu
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Leu Ala Asp Val Leu Ala Gly Leu Ser Pro Gln Thr Pro Gln Val Pro
2275 2280 2285

25 Phe Phe Ser Thr Leu Glu Gly Ala Trp Ile Thr Glu Pro Ala Leu Asp
2290 2295 2300

Gly Gly Tyr Trp Tyr Arg Asn Leu Arg His Arg Val Gly Phe Ala Pro
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Ala Val Glu Thr Leu Ala Thr Asp Glu Gly Phe Thr His Phe Val Glu
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Val Ser Ala His Pro Val Leu Thr Met Ala Leu Pro Glu Thr Val Thr
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Gly Leu Gly Thr Leu Arg Arg Asp Asn Gly Gly Gln His Arg Leu Thr
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2370 2375 2380

Ser Leu Leu Pro Thr Thr Thr Thr His Pro Asp Leu Pro Thr Tyr Ala
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Phe Gln Thr Glu Arg Tyr Trp Pro Gln Pro Asp Leu Ser Ala Ala Gly
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090334-488660

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1911

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 Phe Leu Leu Asp Glu Leu Thr Ser Thr Pro Gly Tyr Asp Leu Ala Ala
 3395 3400 3405
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 Gly Ala Tyr Ala Ala Ala Asn Ala Thr Leu Asp Ala Leu Ala Trp Arg
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 Arg Leu Ala Arg Ser Gly Ala Thr Pro Met Asp Ser Glu Leu Thr Leu
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 Glu Gly Val Leu Ala Ser Leu Ala Pro Ala Ala Gly Gly Arg Pro Glu
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099334
 4838660
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Leu Ala Ala Arg Leu Arg Ala Leu Ala Ala Ala Leu Gly Asp Asp Gly
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<212> PRT

15 <213> *Streptomyces venezuelae*

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 35 40 45
 Gly Ile Arg Ser Pro Glu Asp Leu Trp Asp Ala Val Ala Ala Gly Lys
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 Asp Leu Val Ser Glu Val Pro Glu Glu Arg Gly Trp Asp Ile Asp Ser
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 Leu Tyr Asp Pro Val Pro Gly Arg Lys Gly Thr Thr Tyr Val Arg Asn
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 30 Ala Ala Phe Leu Asp Asp Ala Ala Gly Phe Asp Ala Ala Phe Phe Gly
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 Ile Ser Pro Arg Glu Ala Leu Ala Met Asp Pro Gln Gln Arg Gln Leu
 115 120 125
 Leu Glu Ala Ser Trp Glu Val Phe Glu Arg Ala Gly Ile Asp Pro Ala
 35 130 135 140
 Ser Val Arg Gly Thr Asp Val Gly Val Tyr Val Gly Cys Gly Tyr Gln
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 Asp Tyr Ala Pro Asp Ile Arg Val Ala Pro Glu Gly Thr Gly Gly Tyr
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 40 Val Val Thr Gly Asn Ser Ser Ala Val Ala Ser Gly Arg Ile Ala Tyr

0088884 11901

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	Gly Val Ala Val Leu Leu Leu Glu Arg Leu Ser Asp Ala Arg Arg Lys		
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	Gly His Arg Val Leu Ala Val Val Arg Gly Ser Ala Ile Asn Gln Asp		
15	290	295	300
	Gly Ala Ser Asn Gly Leu Thr Ala Pro His Gly Pro Ser Gln Gln His		
	305	310	315 320
	Leu Ile Arg Gln Ala Leu Ala Asp Ala Arg Leu Thr Ser Ser Asp Val		
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20	Asp Val Val Glu Gly His Gly Thr Gly Thr Arg Leu Gly Asp Pro Ile		
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	Glu Ala Gln Ala Leu Leu Ala Thr Tyr Gly Gln Gly Arg Ala Pro Gly		
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	Gln Pro Leu Arg Leu Gly Thr Leu Lys Ser Asn Ile Gly His Thr Gln		
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	Trp Pro Glu Arg Pro Gly Arg Leu Arg Arg Ala Gly Val Ser Ala Phe		
	435	440	445
	Gly Val Gly Gly Thr Asn Ala His Val Val Leu Glu Glu Ala Pro Ala		
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	Val Glu Glu Ser Pro Ala Val Glu Pro Pro Ala Gly Gly Gly Val Val		
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	Pro Trp Pro Val Ser Ala Lys Thr Ser Ala Ala Leu Asp Ala Gln Ile		
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0998834 11901

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	Met Pro Glu Gly Leu Val Arg Gly Thr Val Thr Asp Pro Gly Arg Val		
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	Ala Phe Val Phe Pro Gly Gln Gly Thr Gln Trp Ala Gly Met Gly Ala		
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	Glu Thr Ala Leu Ser Pro Tyr Val Asp Trp Ser Leu Glu Ala Val Val		
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	Arg Gln Ala Pro Ser Ala Pro Thr Leu Asp Arg Val Asp Val Val Gln		
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	Pro Val Thr Phe Ala Val Met Val Ser Leu Ala Lys Val Trp Gln His		
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	Val Val Thr Leu Arg Ser Lys Ser Ile Ala Ala His Leu Ala Gly Lys		
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	Gly Gly Met Ile Ser Leu Ala Leu Ser Glu Glu Ala Thr Arg Gln Arg		
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	Ile Glu Asn Leu His Gly Leu Ser Ile Ala Ala Val Asn Gly Pro Thr		
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	Ala Thr Val Val Ser Gly Asp Pro Thr Gln Ile Gln Glu Leu Ala Gln		
	725	730	735
30	Ala Cys Glu Ala Asp Gly Ile Arg Ala Arg Ile Ile Pro Val Asp Tyr		
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	Ala Ser His Ser Ala His Val Glu Thr Ile Glu Asn Glu Leu Ala Asp		
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	Val Leu Ala Gly Leu Ser Pro Gln Thr Pro Gln Val Pro Phe Phe Ser		
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	Thr Leu Glu Gly Thr Trp Ile Thr Glu Pro Ala Leu Asp Gly Gly Tyr		
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	Trp Tyr Arg Asn Leu Arg His Arg Val Gly Phe Ala Pro Ala Val Glu		
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40	Thr Leu Ala Thr Asp Glu Gly Phe Thr His Phe Ile Glu Val Ser Ala		

098834 1191

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	His Pro Val Leu Thr Met Thr Leu Pro Asp Lys Val Thr Gly Leu Ala				
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	Ala Glu Ala Trp Ala Asn Gly Leu Ala Leu Asp Trp Ala Ser Leu Leu				
	865		870		875
	Pro Ala Thr Gly Ala Leu Ser Pro Ala Val Pro Asp Leu Pro Thr Tyr				
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10	Ala Phe Gln His Arg Ser Tyr Trp Ile Ser Pro Ala Gly Pro Gly Glu				
	900		905		910
	Ala Pro Ala His Thr Ala Ser Gly Arg Glu Ala Val Ala Glu Thr Gly				
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	Leu Ala Trp Gly Pro Gly Ala Glu Asp Leu Asp Glu Glu Gly Arg Arg				
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	Ser Ala Val Leu Ala Met Val Met Arg Gln Ala Ala Ser Val Leu Arg				
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	Leu Thr Gly Leu Gln Leu Pro Pro Thr Val Val Phe Gln His Pro Thr				
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	Trp Ala Val Ala Glu Pro Ser Asp His Glu Gln Ala Glu Glu Glu Lys				
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	Ala Ala Ala Pro Ala Gly Ala Arg Ser Gly Ala Asp Thr Gly Ala Gly				
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30	Ala Gly Met Phe Arg Ala Leu Phe Arg Gln Ala Val Glu Asp Asp Arg				
	1060		1065		1070
	Tyr Gly Glu Phe Leu Asp Val Leu Ala Glu Ala Ser Ala Phe Arg Pro				
	1075		1080		1085
	Gln Phe Ala Ser Pro Glu Ala Cys Ser Glu Arg Leu Asp Pro Val Leu				
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	Leu Ala Gly Gly Pro Thr Asp Arg Ala Glu Gly Arg Ala Val Leu Val				
	1105		1110		1115
	Gly Cys Thr Gly Thr Ala Ala Asn Gly Gly Pro His Glu Phe Leu Arg				
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 Leu Ala His Glu Leu Ala Phe Arg Leu Glu Arg Ala His Gly Ala Pro
 1205 1210 1215
 10 Pro Ala Gly Ile Val Leu Val Asp Pro Tyr Pro Pro Gly His Gln Glu
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 Pro Ile Glu Val Trp Ser Arg Gln Leu Gly Glu Gly Leu Phe Ala Gly
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 Glu Leu Glu Pro Met Ser Asp Ala Arg Leu Leu Ala Met Gly Arg Tyr
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 Leu Leu Val Arg Ala Ser Glu Pro Leu Gly Asp Trp Gln Glu Glu Arg
 1285 1290 1295
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 1300 1305 1310
 Pro Gly Asp His Phe Thr Met Met Arg Asp His Ala Pro Ala Val Ala
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 Gly Lys
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 Gly Asp Glu Val Trp Leu Val Val Gly Tyr Asp Arg Ala Arg Ala Val
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 Leu Ala Asp Pro Arg Phe Ser Lys Asp Trp Arg Asn Ser Thr Thr Pro
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 Leu Thr Glu Ala Glu Ala Ala Leu Asn His Asn Met Leu Glu Ser Asp
 85 90 95
 35 Pro Pro Arg His Thr Arg Leu Arg Lys Leu Val Ala Arg Glu Phe Thr
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 Met Arg Arg Val Glu Leu Leu Arg Pro Arg Val Gln Glu Ile Val Asp
 115 120 125
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106TTT"4EE88660

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 165 170 175
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 Glu Met Ser Gly Tyr Leu Ser Arg Leu Ile Asp Ser Lys Arg Gly Gln
 195 200 205
 Asp Gly Glu Asp Leu Leu Ser Ala Leu Val Arg Thr Ser Asp Glu Asp
 10 210 215 220
 Gly Ser Arg Leu Thr Ser Glu Glu Leu Leu Gly Met Ala His Ile Leu
 225 230 235 240
 Leu Val Ala Gly His Glu Thr Thr Val Asn Leu Ile Ala Asn Gly Met
 245 250 255
 15 Tyr Ala Leu Leu Ser His Pro Asp Gln Leu Ala Ala Leu Arg Ala Asp
 260 265 270
 Met Thr Leu Leu Asp Gly Ala Val Glu Glu Met Leu Arg Tyr Glu Gly
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 Pro Val Glu Ser Ala Thr Tyr Arg Phe Pro Val Glu Pro Val Asp Leu
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 Asp Gly Thr Val Ile Pro Ala Gly Asp Thr Val Leu Val Val Leu Ala
 305 310 315 320
 Asp Ala His Arg Thr Pro Glu Arg Phe Pro Asp Pro His Arg Phe Asp
 325 330 335
 25 Ile Arg Arg Asp Thr Ala Gly His Leu Ala Phe Gly His Gly Ile His
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 Phe Cys Ile Gly Ala Pro Leu Ala Arg Leu Glu Ala Arg Ile Ala Val
 355 360 365
 Arg Ala Leu Leu Glu Arg Cys Pro Asp Leu Ala Leu Asp Val Ser Pro
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<213> *Streptomyces venezuelae*

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	Leu	Ala	Ala</																

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